Volume 2, Number 5
December 1971

A publication
of the
Ontario Institute
for Studies
in Education

Ideas
about Teaching
and Learning

ORBIT 10

May peace,
prosperity, and joy
be yours this
Christmas season.

The Editor and Staff

Vol. 2/No. 5/December 1971
A Publication of the Ontario Institute
for Studies in Education

ORBIT 10

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Editor: Hugh Oliver
Assistant Editors: Jean Shapter, Ruth Sims
Designer: Burton Kramer Associates Ltd

Cover: 16th-century woodcut
Consultant Panel: W. R. Wees (Chairman)/J. Main/D. Ellis/D. Hunt/F. Rainsberry, OISE
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Audience: *Orbit* is published by the Ontario Institute for Studies in Education for everybody involved in or concerned with education.

Contributions: We should be glad to receive from readers articles about educational practice, criticisms of past issues of *Orbit*, and suggestions for future issues. Before submitting full-length articles, for which an honorarium will normally be paid, a preliminary letter should be sent to the editor.

Subscriptions: $3.00 per volume (5 issues). Not published in August. Available only to subscribers; no individual copies for sale. Subscriptions should be addressed to Publications Sales, OISE, 252 Bloor Street West, Toronto 5, Ontario.
Please enclose a check or money order payable to the Ontario Institute for Studies in Education.

My trip to Scandinavia

Random Reflections on the Educational and Social Systems in Sweden, Denmark and Finland

Bruce Rusk,
Faculty of Education,
University of Windsor

Town center of Tapiola, a garden city-suburb of Helsinki.

Despite the avant-garde views of the Scandinavians on sex and morality, their educational system is quite conservative. Scandinavia is dominated economically, and therefore educationally, by Sweden. The Norwegians and the Finns perceive themselves as 'the poor woodsmen of the North,' who must struggle to keep pace with their prosperous neighbor. The Danes, a Danish educator told me, are more reflective than the Swedes: 'We are existentialists whereas the Swedes are behaviorists.' But while the Danes have led the way in progressive social legislation, they too have tended to follow the lead of Sweden in recent educational changes.

Last year, before visiting Piaget's institute in Geneva, I traveled to Scandinavia to observe the educational and social systems. I was particularly interested in the integration of educational and social services into community development. The trip took me to Helsinki, where I attended a seminar on Finnish architecture and urban planning; Stockholm, where I was the guest of the Stockholm Board of Education; and Copenhagen, where the Danish Ministry of Education made arrangements for my visit.

Sweden

The Swedish educational system is highly centralized, and all major educational decisions, including curriculum changes, must be approved by the Swedish parliament. In 1962 legislation was passed for the establishment of comprehensive schools at which attendance is compulsory. In these schools the curriculum is highly regimented, ranging from twenty hours of compulsory subjects a week in grade 1 to thirty-five hours in grades 5 and 6. Only in grades 7, 8, and 9 are students permitted options: four hours a week on an optional subject and two hours more on optional work.

Until this year upper secondary education was divided among the three-year *gymnasium,* which normally leads to university, the two-year *fackskola,* or professional school, and the *yrkesskola,* or vocational school. This year Sweden began moving toward a totally integrated secondary school that combines the three types of upper secondary school program in one institution.

Much of the interest in Swedish education is currently on flexible scheduling, and the ideas of the American educator J. Lloyd Trump seem to have been used as the unacknowledged blueprint for many of the educational reforms. I was told by both Danes and Finns to mention Trump's name when talking with Swedish educators, obviously in the hope that I would embarrass the Swedes.

Denmark and Finland have begun to follow Sweden in developing a system of comprehensive and integrated schools. However, in conversations with Danes, Finns, and even some Swedes, a resentment of this trend kept appearing. There was a feeling that the Swedish drive for efficiency was leading not only Sweden but the whole of Scandinavia toward an educational model based on American technology. The resentment is further aggravated by the fact that Sweden's economy is much stronger, and the Swedes have instituted educational reform without considering economic priorities. The relationship of the rest of Scandinavia to Sweden in the area of educational innovation seemed to me to have interesting parallels to the relationship that has existed between Canada and the U.S. I gained the impression from many people I met that Swedish efficiency has resulted in an overemphasis on forms and structures and that little attention has been paid to curriculum content.

While the school system in Sweden is traditional, the social services rank among the most progressive in the world. Up to the age of sixteen, every child receives a general allowance of $240 a year, free medical service in child welfare centers or in schools, free school books, supplies, and meals, and a study allowance of $15 a month. Free dental care is provided up to age fourteen. In addition, children and young people in Stockholm may attend supervised playgrounds, play schools, or day nurseries, and after-school centers or youth centers, depending on their age. Outside Stockholm there is still a need for further development of these services. Special educational grants are also made to handicapped children, children of unwed mothers, and children from low socioeconomic backgrounds. All these programs are supervised by the social welfare department, while education falls under the cultural department of each municipality.

The schools in Sweden tend to be used only for academic programs; other buildings house the after-school and youth programs. One interesting social program, however, does take place in the schools. Elderly people receive free lunches in school cafeterias and tend to use the school as a community center. In a discussion with a member of the Planning Department of Stockholm, I also learned of a proposal for a community development that would combine an integrated nursery, day-care center, and elementary school (grades 1-6), a community center, recreational facilities, and shopping and laundry facilities. As in similar situations in North America, the fate of this imaginative concept was dependent on the results of a pending election.

Facilities for special education are extremely impressive. Currently, the Swedes are in the process of integrating special education units with the school system. I visited one school where a wing has been added to house physically handicapped children. These children receive therapy and some instruction in their own unit, but attend regular classes with the other children whenever this is possible. During recess, they play with 'normal' children in the playground. While the move toward integrating handicapped children with others is laudable, on this occasion, and on another when I visited a nursery school, my impression that there was an emphasis in Sweden on structure rather than program was strengthened. I saw only one handicapped child in an integrated classroom situation and the teacher seemed not to know how to include him in the activities of the class. In the nursery school I visited, the program has the usual emphasis on play although it was recognized that many of the children from immigrant backgrounds have serious language problems and require compensatory educational programs.

The social services in Sweden have led to one of the highest costs of living in the world. Even now I still gulp when I recall paying $1.50 for a mug of beer. And still all the needs are not met. Outside Stockholm, I was told, there is a serious need for more day-care facilities. Sweden is also beginning to suffer from an overinvestment in education – a surplus of white-collar workers and a deficit of blue-collar workers. In Sweden as in Canada, educated citizens are experiencing difficulty finding the kind of job for which they have prepared themselves. On the other hand, workers from Spain, Italy, Greece, Turkey, and Finland are being brought into Sweden, as well as Denmark, Germany, and Switzerland to fill the need for unskilled or semi-skilled labor. However, they are not given landed immigrant status and consequently tend to be male migrants who return home regularly to their families. I saw many of them close at hand on an uncomfortable train ride through Germany to Switzerland on the Hispania Express.

Denmark

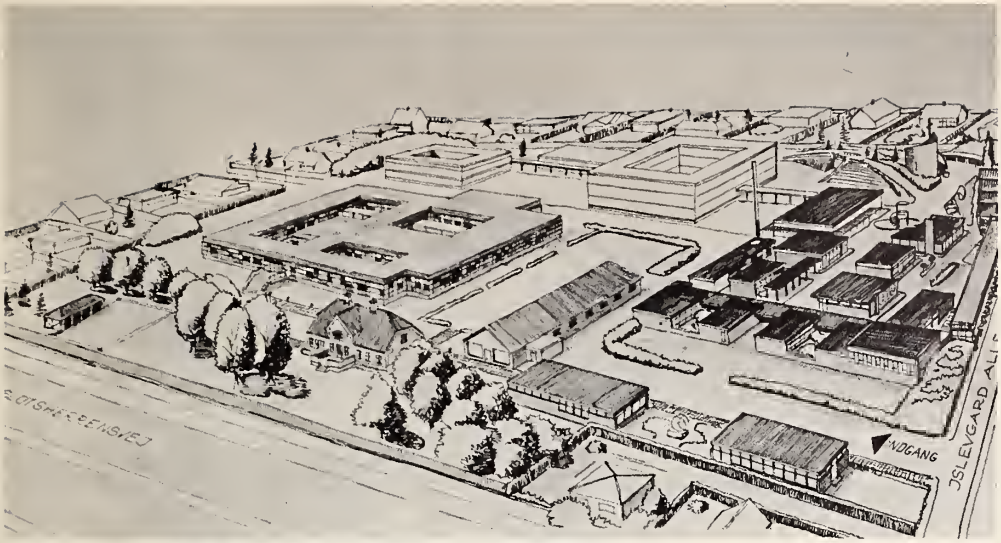
The Swedes are basically a conservative people whose life-style and attitudes have not been radically affected by progressive legislation. However, among the Danes, legislation seems to have been accompanied by corresponding changes in behavior and attitude.

One of the significant changes in Danish education has been the democratization of the educational institutions by government legislation. By law, students are now to be included in educational decision-making. The headmaster of a teachers college admitted to me that the democratization of his college, which gave students an equal voice with faculty, was the most significant thing to happen to the place. The students I spoke to were less enthusiastic. While they felt that they could communicate their needs and expectations more openly to the teachers and that their views were respected, they also felt that, despite their willingness, the teachers in the college were incapable of change.

An interesting outcome of the democratization of the universities is an institute established by Ole Thomsen at the University of Copenhagen to assist faculty in changing to meet the demands of the students for better instruction and more relevant courses. Faculty receive training in styles of lecturing, methods of conducting seminars and group discussions, and techniques of counseling and evaluating students. The initial program is also followed up with continuing discussions. Although there is no incentive to university faculty to attend, other than social pressure, I was told that the institute has been unable to meet the demand for admission to the program.

One of the distinctive features of Scandinavian education since the mid-nineteenth century has been the folk high schools. Originating in Denmark and spreading to the other countries, these are popular adult education institutions designed to orient the individual to changing societal conditions. The folk high schools have played an important role in promoting the national languages of southern Denmark, Norway, and Finland, in improving agricultural techniques, and in orienting the population to industrialization and urbanization. Most of the folk high schools are located in rural settings, provide living accommodation, and offer courses of from several weeks to several months duration. The age for entrance in Denmark and Sweden is eighteen and in Norway and Finland sixteen (a reflection of the projected end of formal schooling in the four countries).

A man in the secretariat of the Danish folk high schools indicated, during a conversation, that these schools are currently going through a crisis. As the normal length of formal education has been extended, the folk high schools have more and more taken on the atmosphere of a holiday camp. At the moment the schools have serious problems with discipline and drugs. A comparison with North America again occurred to me. In North America, education has always been a monopoly of the school system and only recently has there been serious discussion of alternative educational programs. In contrast, because the monopoly in Denmark has expanded and the length of formal schooling has been extended, the folk high schools, which were an accepted alternative program, have lost their significance and now require redefinition.



The innovation center at Rødovre, a suburb of Copenhagen.

A place I discovered too late to visit was the innovation center for grades 8 to 10 at Rødovre, a suburb of Copenhagen, where there was already a 'youth town.' The center is being developed by the municipality, the Ministry of Education, and representatives of various trades and industries. It consists of a town hall, insurance buildings, a bank, a commercial building, a church, shops for wood, metal, and construction work, hothouses, and a laboratory for agriculture, as well as residences and classrooms. Students and their teachers spend two weeks at the center and live together in family units of four. During this period they are expected to become involved in two of the following areas: agriculture, commerce, clerical work, domestic work, social work, pedagogical training, art, building trades, metalwork, mechanical work, woodwork, life of the community, life of the family, film, and theater. Through their participation in this mini-society, students are expected to gain the practical experience of working and running a home, a deeper understanding of the functions of a community, and an awareness of future directions for their own education.

Finland

Education in Finland is complicated by the fact that 8 percent of the population is Swedish speaking, and Swedish, along with Finnish, is an official language. English, however, is the *lingua franca* of Scandinavia and is the second language taught in the other Scandinavian countries. A major preoccupation of Finnish education is the study of three languages – Finnish, Swedish, and English – an effort that has to date, at least from my observations, produced slim results.

The architect in Finland plays an important role in society, and all Finns are extremely proud of their architecture. The modern public buildings, universities, theaters, and churches are quite impressive. Competitions are even held for the design of water-towers. However, while the planners have had some effect on the overall planning of communities, the architects have had little effect on housing. Modern apartments in all of Scandinavia resemble the boxes within boxes that we have produced in Canada, and attempts to innovate and introduce new programs and facilities have met with resistance both from governments and from residents. This was quite contrary to my expectations of a highly centralized, highly socialized, political system.

The one exception I discovered was Tapiola, a garden city-suburb of Helsinki. Begun in 1951 by a private foundation backed by six social and trade organizations, Tapiola was designed to house sixteen thousand people, with a maximum of twenty-six per acre. The town consists of a center, with administrative, cultural, and business facilities, and three neighborhoods. Each neighborhood has its own grocery store within 250 yards of every housing unit. Housing is in both multistoried and low buildings. One heating unit serves the whole community. Eighty percent of the building sites were originally allocated to state-subsidized housing. As with most housing in Europe, apartments are purchased rather than rented. Home and apartment owners in Tapiola are also stockholders in the foundation, and eventually the administration of the whole community will be in their hands.

Like the stores, the schools in Tapiola are distributed among the neighborhoods and the town center. Each neighborhood has its own nursery and elementary school. Public baby-sitting services are also provided in the various parks through a staff of 'nannies.' One secondary school serves the whole community. This school is the focus for adult educational programs as well. As in the other countries I visited, adult education emphasizes academic subjects and is aimed at upgrading the educational level of those who left school early. The Technological University at Otaniemi is adjacent to Tapiola and must be one of the most attractive and architecturally interesting campuses in the world. The most prominent building is the student union, reflecting the role the student has in Scandinavian society.

Longer stays in Rødovre and Tapiola and a visit to another of the five Scandinavian countries, Iceland, are marked down for my next trip to Scandinavia. Norway I had visited on a previous trip.

A conversation with a man in the Ministry of Greenland in Copenhagen provided me with some final reflections on the value of education. Most of the population of Greenland, a Danish territory, live on the west coast and have until recently survived by fishing. Since education is unquestionably 'a good thing,' the Danes decided to build schools and educate them. Soon, however, they became too educated to fish, and since there is no other industry and little hope of developing one in Greenland, they now live on welfare. Periodically, when I begin to take my work too seriously, I recall the view of the icefields of Greenland I had on the flight home, and wonder.

Moral Education in Ontario Schools

Moral education is going on in our schools, whether we like it or not. And an increasing number of teachers and students are asking that it be encouraged – even to the point where courses devoted to the discussion of moral issues are included in the school curriculum.

The word 'moral,' here, is to be interpreted broadly. It is popularly associated with the use, abuse, or non-use of sex, alcohol, drugs, and the like. In the 'hidden curriculum' of many teachers, it is tied to punctuality, neatness, docility, and conscientiousness in schoolwork. But many of those who are pressing for moral education in the schools obviously have in mind the discussion of a wide range of issues, including parent-child relationships, civil disobedience, business ethics, the moral status of war, mercy killing, inequalities in society, crime and punishment, and 'quality of life.'

General approval has not yet been given in Ontario to offering an entire course in morals, even as a one-year option at the senior high school level. In this respect, the study of morals is trailing behind the study of world religions, which now has government approval as a course. There are two main reasons for this. First, the introduction of an optional course in world religions at the senior high school level was a highly visible recommendation of the Mackay Report that the government could rather easily implement. Second, it is generally believed that a historico-cultural-comparative study of world religions such as the one proposed would be relatively uncontroversial.

In the long run, however, it is probable that the study of morals will prove to be less controversial than the study of religion. On the one hand, many people contend that a historico-cultural-comparative study of religion will destroy the religious faith of the young; on the other, many will no longer tolerate systematic instruction in particular religious dogmas. Further, the demand for the study of values in the schools – and at all educational levels – is already great and will likely continue to increase rapidly, while the study of religion, particularly in the lower grades, is in general less feasible.

Another reason for *relative* optimism regarding the future of teaching morals or ethics in schools is the large amount of systematic, mutually supporting research into moral education that is taking place in different parts of the world. In continental Europe, for example, courses in ethics have been offered in high schools for many years. This may be seen as large-scale classroom experimentation from which we may benefit. Jean Piaget in Geneva has also made many valuable contributions to our knowledge of the moral development of children. In Great Britain, two major moral education projects (supported by the Farmington Trust and Schools Council respectively) and a number of smaller ones have been operating for the past three or four years. And in the United States, Lawrence Kohlberg has been doing extensive research into moral development since the mid-fifties, and in the past three or four years at Harvard he has turned his attention more specifically to problems of moral education. In Canada, there are small projects under way in Vancouver and Calgary. Farther east, there is considerable theoretical interest at Althouse College in London, and two major projects have been initiated at OISE in Toronto, one in moral education and the other on Canadian public issues, which touches on a number of moral issues.

A further source of encouragement is that a connected body of literature on moral education is developing. Apart from Piaget's classic work *The Moral Judgment of the Child* (Routledge & Kegan Paul, 1932), there are more recent publications such as Peck and Havighurst's *The Psychology of Character Development* (Wiley, 1962), the Farmington Trust Project's *Introduction to Moral Education* (Penguin, 1967), a collection edited by Theodore and Nancy Sizer, *Moral Education: Five Lectures* (Harvard University Press, 1970), and John Wilson's *Education in Religion and the Emotions* (Heinemann, 1971). A publication resulting from a recent OISE conference is *Moral Education: Interdisciplinary Approaches* (University of Toronto Press,1971). It includes papers by the psychologists Lawrence Kohlberg, Justin Aronfreed, and David Ausubel, the philosophers, Kurt Baier and David Gauthier, and a curriculum theorist, Don Oliver, who is a specialist in social studies teaching. The papers in this book were used extensively by the Mackay Committee in preparing its report, and the book has been well received by teachers doing summer school work at OISE. In addition, a teacher handbook called *Moral Education in the Schools: Some Practical Suggestions* was published by OISE last month, and Professor Eisenberg, Director of the Canadian Public Issues Project, is currently preparing a similar handbook in his area. Both of these handbooks have arisen from research in Ontario classrooms.

From the point of view of research and research literature, then, the stage is set for the introduction of programs in ethics in Ontario schools. Work has yet to be done, but we must not be too hesitant. If students, teachers, parents, and school boards see the need, a program in moral education, at least on a trial basis, is surely justified.

Just what is possible within present Department of Education guidelines? The answer is, a surprising amount. Although courses concerned *entirely* with ethics are normally excluded, the Department has made it clear again and again that the discussion of values within the context of other school subjects is legitimate. Indeed, a course in economics was recently returned for revision because it did not give sufficient attention to such questions. Obviously the same outlook must apply to courses in such fields as guidance, man and society, and health.

Within any group of schools, elementary or secondary, a coordinated, interdepartmental program in values could be implemented. If the study of values were 'organically fused' with the current activities of existing departments, a number of obstacles, including the addition of 'yet another subject' to the school curriculum, would be overcome.

A good way of setting up such a program in a particular school board area would be to form a committee of consultants, teachers, and students from both elementary and secondary school levels. This committee could provide general guidance and coordinate work at the two levels. It could enunciate the principles and concepts of the program and draw up a list of topics with suggestions concerning sequence and pacing. It could also supervise the related inservice training of teachers and assess the overall success of the program.

The allocation of topics to departments and by age level, the involvement of

Clive Beck,
Department of History and Philosophy,
OISE

particular teachers, and the detailed assessment of the program could be taken care of by a committee set up within each school.

As is suggested by the foregoing, one of the first steps in planning a program in moral education should be to identify the topics to be dealt with and the ages at which they can best be studied. Almost inevitably, certain topics will appear several times for use with different age groups, but because of the changing nature and depth of the approach as the child becomes more mature, repetition should not result. A representative sampling of topics follows.

A. *Personal and Social Values in General* (ages 5 to 9)
Helping other people
The self and others
Making up one's mind
Valuable goals in life

B. *Human Relations* (ages 10 or 11)
The individual's need for other people
Different values and rules in our society
Loyalty and patriotism
The place of the inner group of relatives and friends
Prejudice against races, social classes, and other groups

C. *Decision Making* (ages 12 or 13)
Personal moral values
Dependence/independence
A working understanding of the world
Worthwhile personal goals to pursue in life

D. *Human Issues in the World Today* (ages 14 or 15)
Freedom and equality in the world today
Means to ends: national and international law
Underdeveloped nations (so-called)
Civil liberties, e.g., in commerce, speech, alcohol, drugs, marriage, and divorce
Social work

E. *Value Theory* (ages 16, 17, or 18)
What is morality? Moral and non-moral values
Moral psychology – human needs and moral ideals
Values in today's world – 'quality of life'
Value theories – developing a value theory
Deciding what to do – the place of beliefs and rules in decision making

Schools would vary in the number of teachers and in the departments or 'subject areas' given responsibility for dealing with values. Initially, involvement within a particular school should not be too extensive. There are two good reasons: first, the burden of inservice training – workshops, classroom demonstrations, and so on – would strain the school's resources; and second, the resulting situation would be little different from the present one, in which everyone is responsible but not much is being done.

Among the subject areas in which the study of values on an 'organic fusion' basis might be encouraged are family living, social studies, and guidance at the elementary level, and health and physical education, history, man and society, English, guidance, and home economics at the secondary level. Sometimes it is obvious which subject area is best suited for the consideration of particular moral issues, but often an arbitrary decision must be made. The rationale of such an interdepartmental program is not so much that moral issues should be assigned to their *proper* subject area as that they should be assigned to *some* subject area (teacher or department) in order to ensure relatively comprehensive coverage and the linking up of value concepts and principles with one another.

Actually, the 'organically fused' study of values should be going on extensively in Ontario already, as any examination of the stated aims of schools reveals. However, in a great many schools the serious discussion of value questions appears to take place so infrequently or in such a disconnected fashion that students are not developing an adequate body of value principles and attitudes. Some teachers, hampered by a lack of guidance and coordination, despair of dealing with such questions thoroughly enough and largely ignore them; others make an attempt, but find that their efforts are too isolated to have a cumulative effect. The students, discouraged by the difficulty of resolving moral issues, tend to either accept the values of persons in authority in a rather thoughtless way or adopt a relativistic view, taking the stance that values are 'just a matter of opinion' and do not require serious thought. It is essential, then, that teachers be given the guidance and coordination to achieve those broad goals of moral education that we have long agreed schools should achieve.

I expressed the view earlier that the study of moral issues could be carried out in a sufficiently noncontroversial way that its introduction into the Ontario school curriculum would be feasible. What is meant by 'noncontroversial' in this context? Surely that we must allow for differences of opinion in the classroom. Students must be able to express quite radical views on ethical matters and have them discussed with appropriate respect and thoroughness. Only in this way can an adequate sharing of concerns and ideas take place and a sufficient range of perspectives be brought to bear on the problems under discussion. But there are a few topics that many members of the public would not wish to have discussed at the lower elementary school level, and these would have to be restricted to appropriate age groups. Further, some extreme remarks by students – for example, 'Murder is often a good thing' – should not be allowed to pass without contrary argument. Then, too, while the teacher should feel free to express his own views, it would be unwise for him to promote them too aggressively. If these pitfalls are avoided, a stimulating and generally acceptable program of studies should emerge.

There is no fundamental objection, then, to a program of incidental or 'organically fused' moral learning similar to that recommended in the Mackay Report. Indeed, the time has come to be more positive about it. In the Province of Ontario, with a carefully formulated government report in our hands and a growing body of research literature and experience at our disposal, it is our *duty* to introduce into our schools a program of coordinated discussion of moral issues. It is a duty that we have to our students, to our society as a whole, and to other societies that at present lack such opportunities for progressive work in moral education.

A volunteer tutoring program

'Peter is not showing the improvement we expected. He needs more individual help than we can give. Perhaps we should ask his parents to work with him at home.'

The problem is not unusual, and the teacher's suggestion represents an increasingly popular solution. For Peter and children like him, however, parental assistance is not the answer. Peter's father is dead and his mother has difficulty filling the dual role of wage-earner and homemaker. If help is to come, another source must be found.

The Beginning

Concern with the plight of the 'Peters' throughout Toronto was the moving force behind a tutoring program undertaken by students from Atkinson College in cooperation with the Big Brothers of Metropolitan Toronto. The service began in 1968-69 as a pilot project serving five boys ranging in age from nine to sixteen who were selected from the Big Brothers' waiting list. As the Atkinson College representative, I was much encouraged by the willingness of Big Brothers to undertake this plan, for their work with boys in fatherless homes dates from 1913 and provides a wealth of experience from which to draw guidance. I was enthusiastic, too, about Atkinson College as a source of tutors. As this college serves the part-time students at York University, its student body is unusually free of arbitrary restrictions and can proceed toward the accumulation of degree credits at a pace that provides for the personal obligations and circumstances of the individual.

In essence, the idea is not new. A number of tutoring programs involving older students or well-educated adult volunteers have been reported in periodicals in recent years. The skills and resources available in this program were, however, somewhat unusual, for the Atkinson volunteers were at once adult members of the community and university students.

From the beginning, I shared responsibility for coordinating and directing the program with Laura Ferrier, a research associate with the Big Brothers. While the Dean of Atkinson College approved the plan in principle, the College accepted no responsibility in the matter and no further administrative machinery was set up.

The pilot project fulfilled our hopes, and the experimental year was considered a success. It was obvious that all of the

Leo Davids,
Assistant Professor of Sociology,
York University

boys had profited from the experience. Encouraged by this situation, we decided to continue the program through 1969-70 and expand it to serve a larger number of boys.

The 1969-70 Program

The selection of boys to take part in the regular program was a major concern, and the choice was finally made through criteria which required that they
a) be from the upper elementary and lower high school grades,
b) have problems related to performance at school rather than to emotional or physical handicaps,
c) be able, by virtue of academic ability and health, to profit from instruction given by untrained volunteers.

Eighteen boys were selected from the Big Brothers' waiting list by Mrs. Ferrier, who later assigned the tutors and arranged for the initial meetings of the boys and their tutors.

Meanwhile a search for tutors was going on at the College. An appeal to students produced nineteen volunteers whose qualifications looked promising, and I was involved in interviewing them. Of the nineteen, ten had previous teaching or tutoring experience and almost all of the remainder had worked with boys in Sunday schools or clubs. Through our application forms, we obtained not only personal information about the volunteers but also a list of the courses they had completed, those they were currently studying, and the amount of time they had available. Free time was an important factor, for although participation did not involve becoming a Big Brother, tutors were required to spend at least two hours a week with the boys. When eighteen tutors had been selected, their names were given to Mrs. Ferrier for assignment.

Mrs. Ferrier and I met with the volunteers each term. Our initial orientation session took place in November and was followed by coordinating sessions in February and a final meeting in June. Nine tutors were still active at the end of the year – a good record in view of the fact that most of the others dropped out because their pupils were no longer available. In some cases the boys left school or transferred to another area, in others they were sent to reformatory, and in still others their complete lack of cooperation defeated the purpose of the program.

Many of the tutors were assisted by the schools in which the boys were enrolled.

Before the program began, we reported our plans to the schools and the tutors were encouraged to discuss with principals, teachers, and guidance heads the best means of helping the boys. Where cooperation was not given, the tutor sometimes faced a difficult situation.

Tutors in the Program

The success of the program depended upon the tutors, and their responsible approach to the task was perhaps our greatest assurance of success. Only rarely and for unavoidable reasons did they cancel sessions, although a considerable amount of time was lost through the tendency of some boys to 'forget' appointments. The motives that brought the tutors into the program no doubt accounted largely for their steady performance. For some, the reason sprang from memories of a deprived childhood, for others from a resolve to do something worthwhile, and for still others from a sincere desire to help a boy in need. In a few cases, volunteers joined the program in an attempt to assess their aptitude for a teaching career.

During the orientation session that was held last November, the program was discussed in depth with the tutors, some of the professional aspects of tutoring were reviewed, and attention was given to handling a variety of problems that might arise. The facilities and program of the Big Brothers were also discussed. Since the usual screening process applied to Big Brother volunteers was waived for our tutors, arrangements were made for them, and also for the boys' mothers, to sign statements indicating that they understood the program and absolved the agency of responsibility in the event of any unforeseen outcome.

The following table shows something of the background of the tutors. Although the numbers are not statistically significant, they indicate possible trends.

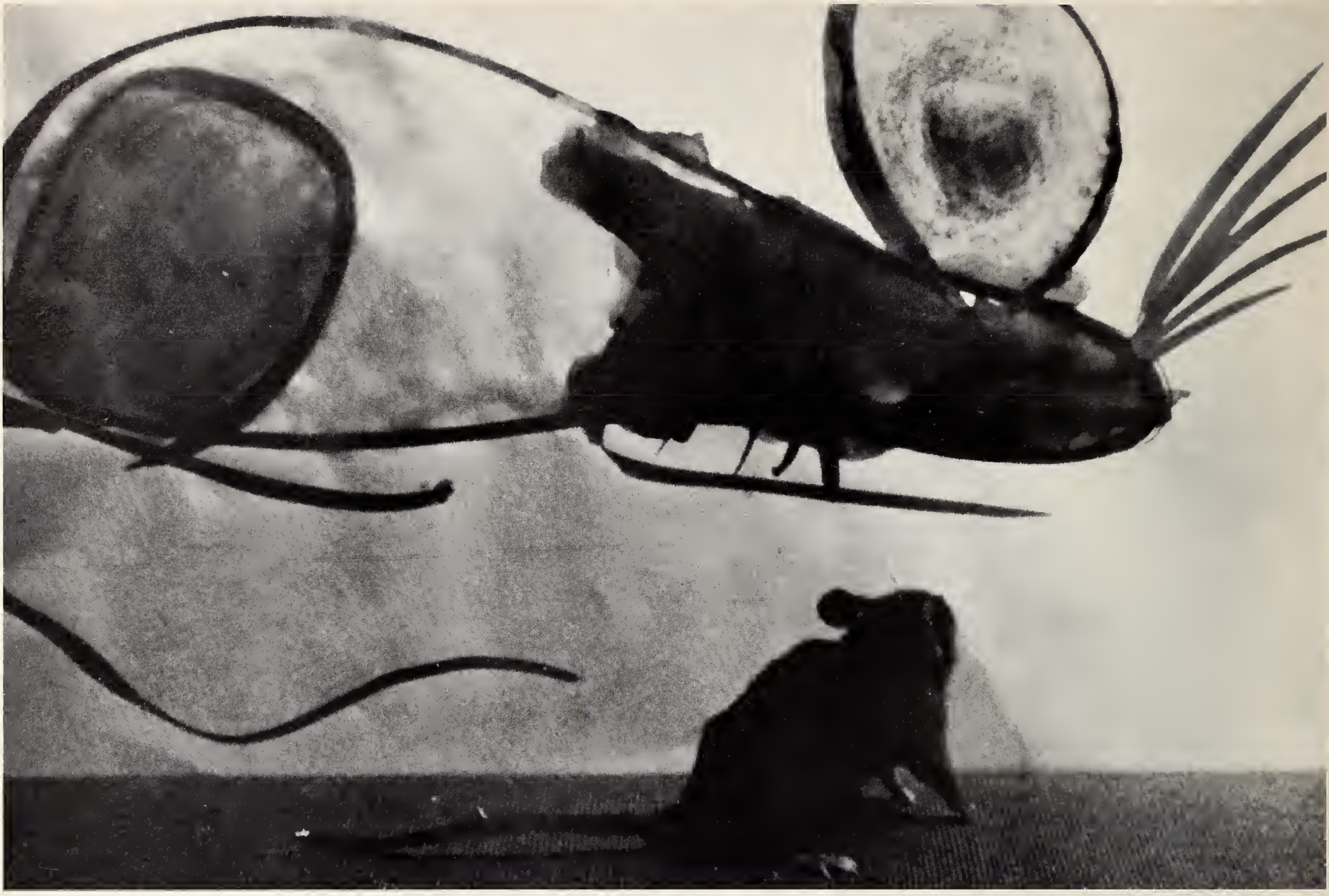
Family status	
single	4
married, no children	8
married, with children	6
Major	
Sociology	8
Economics	3
Other	7
Number of courses currently enrolled in	
one	8
two	9
three or more	1
Teaching or tutoring experience	10

Program Activities and Results

Although the boys were at different levels in school, all of them had marked reading difficulties – a situation that doubtless accounted for much of their poor performance at school. As a result, the major focus of the tutors' efforts was on reading. Spelling and mathematics also absorbed considerable time. Some of the tutors undertook to stimulate the boys' interest in learning by relating their studies to life experiences through visits to museums and places of historical interest. Basic to all their efforts, however, was concentration on building good study habits and improving general learning skills.

At the year's end, all of the boys who remained in the program were promoted. In addition, their attitudes toward school showed marked improvement, and their capacity for working successfully on their own had increased. The friendship of the tutors greatly affected the boys, and several mothers spoke enthusiastically of the self-confidence their sons had acquired through these relationships. Perhaps even more significant from our standpoint were the requests of a number of mothers that the same volunteers be assigned to their children the following year if the service was continued.

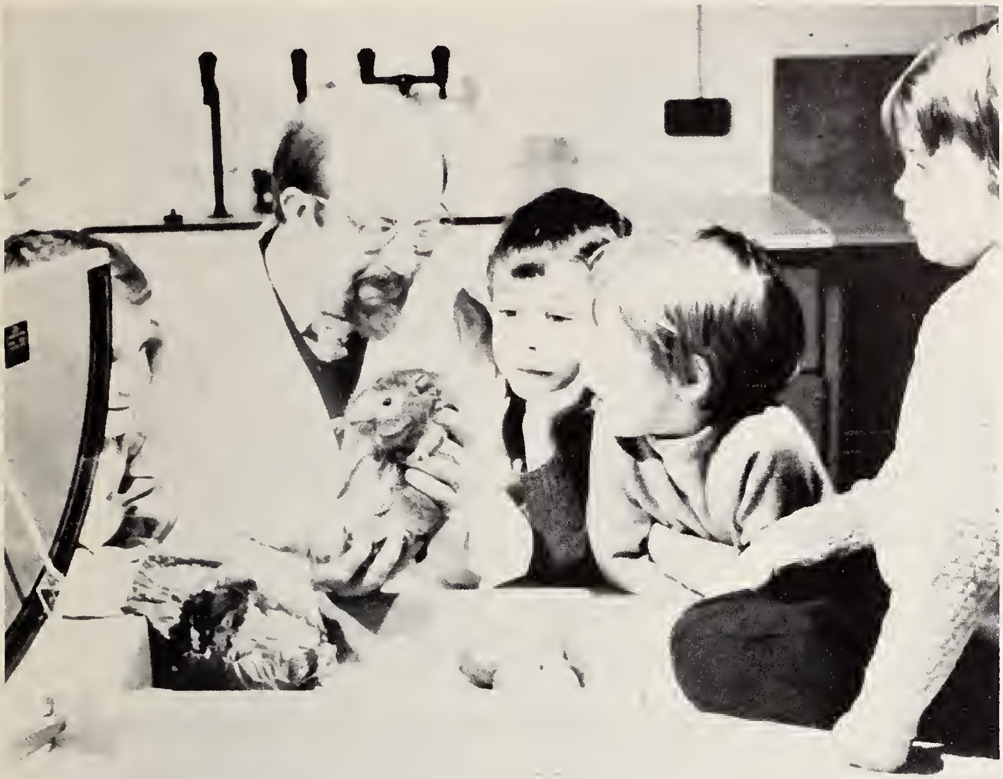
Experience indicated that our program was valid, and the expressions of satisfaction from schools and mothers, as well as the obvious changes in the boys, showed that it reinforced both academic and social values. Our tutors saw it as a worthwhile experience that most of them would be willing to repeat. Big Brothers, too, profited from participation. One of our volunteers became so interested in the work that he decided to join the ranks of their regular workers.



KEEPING THINGS ALIVE

The following article is reprinted from Dialogue, number 7, a publication of the Schools Council in the U.K.
The article is written by John Wray, Research Fellow in the Council's Educational Use of Living Organisms Project.

Small mammals may stimulate creative work in art or measurements may be made on them to provide quantitative scientific data.



It is important that children be encouraged to learn a sense of responsibility towards all other living creatures.

Modern biology teaching is concerned more and more with the study of the lives and activities of living organisms. No longer is it a matter of studying dead specimens and trying to discover through these the nature of such lives and activities. The use of living things is now emphasized right through from the primary school to the university. All recent curriculum development projects involving biology have accepted that the 'raw material' must be alive.

Two areas stand out to us as particularly important, since it is in these that the major problems arise. The first area is supply; the second, maintenance. Our research project was set up to study these areas and many related educational problems.

Usually living organisms are collected or bought for school use. Collection in the field by a teacher, his pupils, or a biological supplier is often difficult and frustrating. At the same time, the urgent need for the conservation of certain animals and plants means that collection from natural habitats must be strictly controlled and, as part of their education in conservation, pupils should see that this is done. More and more, then, we have to depend on culturing and on maintaining stocks of organisms, and with rising costs, including postal and delivery charges, we need to examine the most efficient and economic means of doing this.

At present, commercial supply agencies meet most of our needs, but some argue that they should be supplemented by the development of centers – possibly based in schools – containing 'banks' which can be quickly distributed to schools. However, this will require careful planning and management and we need to know more about their potential value and the most advantageous form they should take.

Such considerations also apply to accommodation within schools. Many schools, for example, have greenhouses – although they are not always used effectively. Very few schools have animal houses. What should be the purpose of such accommodation? For maintenance and supply only? Should it have a wider educational purpose, with children being allowed to use it actively? What variety of species should be accommodated? Is it possible to house such a variety of living things in a relatively confined space? We hope our project's research will lead to suitable recommendations for the design and use of appropriate accommodation.

But what about the teacher? The maintenance of living organisms gives rise to many difficulties, particularly during weekends and extended holiday periods. If local 'banks' or – more particularly – houses and rooms were available, many of the problems associated with supply and maintenance would be reduced.

An important aspect of our work is the development of teaching techniques. One such technique which we think is promising and hope to develop is the use of 'mini-habitats.' We are looking at the idea of using small environmental chambers housing a very limited variety and number of living things as a flexible study unit suitable for many applications in schools. With 'mini-habitats,' many ecological topics could be studied in the school laboratory, including, for instance, the influence of environmental factors, the flow of energy in a food chain, and population numbers and their control. All this can be planned at a level appropriate to the age and ability of the pupils.

In evaluating the use of this technique – as with other aspects of our work – the responses of pupils will be carefully studied. Their reaction and relationship to the living organisms used in schools is obviously of critical importance.

We are also examining and collating information already available from a variety of

Common organisms may be easily obtained outdoors. Their structure and activities can then be related to the environment.

One important aspect of maintenance is correct management and handling.

sources. Our first questionnaire, which we sent to over 250 primary and secondary schools, formed part of an initial survey to investigate the living organisms currently found in schools. Analysis of this questionnaire has confirmed many of our views on the problems associated with their supply and maintenance and has revealed several topics worthy of investigation in the future.

We hope that as a result of this and other questionnaire surveys, trials of various organisms, and other enquiries, the needs of schools and the many associated problems will be clearly defined. The most useful organisms will be identified and evaluated, and suitable maintenance techniques – with appropriate teaching procedures – devised. We think at present that the most important criterion of a 'useful' species will be its potential for a multiplicity of educational uses. With this in mind we believe it will be possible to rationalize and reduce the total number of species which should be maintained in schools and thus the problems involved.

A series of booklets on animal houses, small mammals, genetics, microorganisms, and several other topics are in preparation, as are wall charts (for example, showing techniques on the handling of small mammals), an extensive source book on the educational use of living organisms, and other publications. Meanwhile, we welcome queries, ideas, and comments from teachers which will help us in this work, for we want to act as a focus of activity and in an advisory capacity.

Please write to me – John Wray, Research Fellow, Centre for Science Education, Chelsea College, Bridges Place, London SW6, England.

Maintenance of organisms often involves the use of special apparatus and techniques.

Les leaders de l'éducation francophone et l'éducation permanente

L'article suivant est tiré d'une étude publiée en mai 1971: 'Les Francophones et l'éducation permanente au Collège Algonquin.' Dans la première partie, nous dit la recherchiste Mlle Lavoie, nous avons esquissé un portrait statistique de la population étudiante francophone inscrite aux cours d'éducation permanente durant le semestre d'hiver 1971. Nous vous donnons une idée de la situation actuelle du français, comme langue d'enseignement, dans la Division de l'éducation permanente au Collège Algonquin d'Ottawa, et cela, pour chacune des facultés . . .

Dans une seconde et dernière partie, nous vous donnons les résultats et résumés d'une enquête faite auprès de la communauté francophone. La quatrième section de cette partie porte le titre: Les leaders de l'éducation francophone et l'éducation permanente.

Pour mieux comprendre ce qui se passait dans la communauté francophone dans le domaine de l'éducation permanente, nous avons cru bon de rencontrer et d'interviewer quelques leaders franco-ontariens de la région. Ces personnes sont:
Dr Laurent Isabelle, Conseiller, Conseil scolaire d'Ottawa
Dr Jean-Robert Gauthier, Conseiller, Conseil scolaire d'Ottawa
L'abbé Jacques Faucher, Président du Comité consultatif de langue française du Conseil scolaire d'Ottawa
M. Pierre Gauthier, Animateur socio-culturel de l'ACFO, région Ottawa-Vanier
Père Achille Hubert, Coordonnateur des Nouveaux Impératifs Communautaires
Mme Adèle Lavoie, Coordonnatrice de l'Opération Sud-est
Mme Denise Chatelain, Coordonnatrice de l'Opération Sud-est
Père Hubert Morin, Conseiller dans Confederation Courts
Père Léonard Morin, Curé de la paroisse Marie-Médiatrice.

Voici résumés les opinions et les points de vue de ces personnes.

Nous pouvons affirmer sans hésitation que l'idée de l'éducation permanente n'est pas lancée dans la communauté francophone. Le problème du recyclage et de l'éducation des adultes n'est pas abordé de façon générale par les associations ou les regroupements franco-ontariens, sauf à quelques exceptions près. Des mouvements approchés, seulement une Association de parents et instituteurs avait élaboré le sujet ouvertement lors d'une réunion publique. L'Opération Sud-est a aussi eu un Comité d'éducation des adultes mais ce comité, pour de multiples raisons, n'a jamais fonctionné.

On ne parle d'éducation permanente que sur un plan individuel, entre amis, très rarement en assemblée publique quelconque.

Le francophone de la région ne valorise pas encore l'éducation permanente. Il n'est pas conscient de ses besoins dans ce domaine et ne voit pas en elle un moyen opportun d'améliorer sa situation financière, son statut ou encore sa personne.

Le francophone de la région n'est pas renseigné; il n'est pas informé et s'il l'est, c'est de façon sommaire et inadéquate. S'il devient conscient d'un besoin d'éducation permanente, il ne sait pas comment procéder pour remplir ce besoin, ne connaissant pas les voies disponibles ou les chemins d'accès.

Trop souvent, l'éducation formelle du francophone (primaire ou secondaire) a été une expérience pénible, voir même traumatisante. Jusqu'à tout récemment il n'a pas eu son propre système français en matière d'éducation et il a dû se contenter parfois, sinon souvent, d'une éducation de second ordre. Pour lui, un retour aux études signifie encore un retour à ce système qui ne lui fournit que de mauvais souvenirs.

Chez le francophone adulte, l'idée que le succès financier réside dans le monde anglophone est encore une idée plus populaire qu'on pourrait le croire. Logiquement, il en déduit que les moyens d'accès, comme une éducation plus poussée ou spécialisée, doivent être aussi anglophones. C'est pourquoi plusieurs francophones s'inscrivent automatiquement, sans même y réfléchir, dans des programmes anglais ou dans des institutions anglaises.

Si le francophone apprécie sa langue, ce n'est souvent que pour sa valeur culturelle et folklorique, sa langue n'ayant jamais été valorisée dans le domaine économique, financier ou industriel. Elle n'a eu dans ces domaines qu'une valeur de langue seconde.

La génération actuellement aux études aura l'avantage d'avoir eu un système d'éducation qui lui est propre et ses réactions face à l'éducation permanente et aux cours en français devraient être assez différentes de celles de leurs parents. Cette différence serait apparente d'ici quatre ou cinq ans déjà.

Le Collège Algonquin n'est assurément pas une institution d'éducation connue au sein de la population francophone. Même les leaders avouaient que leur connaissance du Collège était plutôt récente et parfois assez nébuleuse.

Le Collège Algonquin est très mal situé géographiquement pour le francophone qui demeure, en grande partie, à l'est du Canal Rideau. Exception faite de l'automobile, le moyen d'accès ou de transport au Collège, l'autobus, est irrégulier, long et surtout peu pratique.

Ces leaders nous ont aussi suggéré le plan d'attaque qu'il faudrait suivre pour rejoindre les francophones de la communauté.

Pour mieux desservir la population francophone, il faudrait d'abord que le Collège Algonquin se fasse mieux connaître dans la communauté francophone. Etant donné que les francophones sont de plus en plus dispersés géographiquement, résultat de la rénovation urbaine – et, qu'ils se regroupent assez peu dans des associations ou endroits bien définis, il faut aller les chercher chez eux. Il faut entrer dans leur demeure par les moyens de communications de masse, la radio, la télévision et les journaux.

En général, si on veut que le francophone participe à une réunion publique ou à des cours d'éducation permanente, il faut l'attirer, il faut le motiver, il faut aller le chercher.

'Whosoever on ye nighte
  of ye nativity
  of ye yonge Lord Jesus,
shall fare forth
  bearing a succulent bone
  for ye lost
  and lamenting hounde,
a whisp of hay
  for ye shivering horse,
a cloak of warm raiment
  for ye stranded wayfarer,
a garland of bright berries
  for one who has worn chains,
a dish of crumbs
  for all huddled birds
  who thought
  that song was dead,
and divers lush sweetmeats
  for such babes' faces
  as peer from lonely windows:

'To him shall be proffered
and returned gifts
of such astonishment
as will rival the hues
of the peacock,
and the harmonies of heaven,
so that though he live
to ye greate age
when man goes stooping
and querulous
because of the nothing
that is left in him,
yet shall he walk upright
and remembering,
as one whose heart shines
like a greate star
in his breaste.'

Anonymous

On solving mathematical problems

A number of studies conducted in Ontario and elsewhere indicate that problem-solving skill in school mathematics may depend on a good knowledge of mathematics, above-average intelligence, and on additional skills which can perhaps be improved by appropriate teaching. Over the past eighteen months, attempts have been made to improve students' problem-solving skills by employing specially designed classroom materials that make extensive use of diagrams.

We can distinguish between three different types of responses a student might make in school mathematics. First, there are rote or automatic responses. For example, given the cue $5 + 6$, the student responds '11' with a promptness that makes us think he 'remembers' that $5 + 6$ is 11. Such a stimulus-response relationship could be represented as $X \rightarrow Y$. Of course, such rote responses need not have been learnt in a rote manner.

Second, there are responses in which the student immediately associates a particular rule (R) with the cue X. Or he may even be told what rule to use. In this case, the relationship is $X \rightarrow R$, with R representing an instruction or demand to proceed in some way with X. When the procedure is carried through, a response Y results. Thus the entire process may be represented as $(X \rightarrow R) \rightarrow Y$. This situation is different from the first type of response because the final response, Y, may never have been made before by the student. Thus, when asked to evaluate $36 \times 6 - 32 \times 6$ using the distributive law, the student may be making particular responses that he has never made before. What he *has* done before, presumably, is to follow the same pattern of operations. We will call this kind of process the direct application of a rule. It certainly involves some understanding of the rule, and is not the same as a rote or automatic response.

Third, there are responses in which a number of rules may be tried, $R_1, R_2, \ldots, R_n$, say. The student is given the set of conditions, X, and he is asked to get from X to some goal, G, using whatever rules he thinks appropriate. This is clearly quite a complex process, but we will represent it simply by

$$(G, X \begin{array}{l} \nearrow R_1 \\ \quad \vdots \\ \searrow R_n \end{array}) \rightarrow Y.$$

This third kind of process we call 'problem-solving.' Solving the problem involves understanding both the conditions and the goal, trying various responses, and judging whether the result really achieves the goal and meets the conditions.

It should be emphasized that the distinctions made above refer to highly idealized situations. All three processes will generally be involved in carrying out real tasks, which are likely to be vastly more complex than the distinctions made above would indicate. Also, whether or not a task elicits a rote performance, a rule application, or problem-solving is bound to depend on both the past history of the student and the kind of performances of which he is presently capable.

Teaching problem-solving skills, then, primarily involves teaching students to think of a range of alternative 'rules' (generalizations or patterns) and to know how to apply these rules. It may be that, provided the student has a good store of rules that he can apply, the teacher cannot further enhance his problem-solving ability. The person's ability to range over the rules may in fact depend on some inherited capacity that is essentially unteachable. However, there is some evidence that problem-solving involves more than merely *possessing* the appropriate 'rules.' In mathematics, a person's knowledge and understanding of patterns and generalizations can be tested fairly easily. Testing his problem-solving ability, however, is somewhat harder, mainly because *true* problems are more difficult than are desirable for a test and generally require a fair amount of time to solve. Nonetheless, some tests purporting to measure problem-solving ability in mathematics have been prepared. I have conducted three studies, two with grade 7 and 8 students in Ontario. In every case, students' performance on the problem tests correlated far more highly with one another than with their performance on standard tests of intelligence or traditional tests of their knowledge and understanding of mathematics. Such studies as these suggest that problem-solving may require something more than just being able to use the 'rules' or even being able to see difficult relationships, although all of these are no doubt necessary. The extra requirements seem to involve the ability to *restructure* the problem situation, so that more rules are tried than are initially suggested by the problem, as well as the ability to critically assess any possible solution.

Some Aspects of Problem-Solving

In solving problems, then, students not only have to handle a great deal of information but also be able to try out a large number of rules. A variety of studies suggest that there are three factors which might prevent this from happening, even though the student does have the relevant knowledge and could easily understand the solution if it were explained.

First, the student may not grasp what the problem is. This is true of both 'story' or 'word' problems and problems couched in mathematical symbols. What appears to happen is that the student tries to 'think' in terms of the words or symbols rather than in terms of the *things* to which the symbols refer. Such thinking works quite well for the student if the exercise is standard – of a 'type' he has done many times before. The response is of the $X \rightarrow Y$ type, or at best of the $(X \rightarrow R) \rightarrow Y$ type. In either case the student is following a well-worn path, which may happen to be totally inappropriate when he is dealing with a type of problem he has not encountered before. We call this kind of error one of *representation*. The student has not properly represented the problem to himself.

Second, while the student may understand what the problem is, he may not be able to keep track of his reasoning sufficiently well to put a solution together. This difficulty is one of attention or concentration. We have all experienced a drop in thinking efficiency when we are distracted by strong emotion or a too attractive rival activity. Some problems are so complex that, even without outside distractions, we may find difficulty in keeping track of the many aspects of the problem. This is particularly true with children. It is basically a matter of *short-term memory span,* which for children is much smaller than it is for adults. Moreover, children are inexperienced at using external aids to memory – notes, diagrams, etc.

Third, many of us, perhaps all of us at times, do not try out all of the appropriate rules we know in attempting to solve a problem. Instead, we often unsuccessfully try the same rule over and over again. This is really a case of negative transfer. A good example is provided by the Luchins jar problems. In this task, the subject is presented with three jars with capacities of 21 pints, 8 pints, and 3 pints respectively, and an unlimited supply of water. He is asked to show how he can deliver exactly 7 pints by appropriately filling and emptying the jars. One direct

at school

Glen T. Evans,
Department of Applied Psychology,
OISE

solution to the problem is symbolized by 21 — 8 — (2 x 3) or A — B — 2C. The subject either discovers or is told this solution, after which he is given five other problems that have the same (A — B — 2C) solution. The eighth problem can be solved with a much simpler solution, of the form B— C, or B + C. It has been found that increasing the number of problems of the first kind decreases the likelihood that the easy solution for problems of the second kind will be found. A control group without *any* experience of the jar problems will do much better on the eighth problem than those who have done the first seven problems.

This tendency to become fixed on a very limited range of responses is universal. In fact, what we call 'trick' questions are just those that trap us into the wrong 'set,' although the solution is usually very simple once seen. We will refer to this difficulty as that of *overcoming set.*

Whether this kind of difficulty occurs with any problem is dependent on how the rules that could be related to the problem were initially learned. If the student is well drilled in a particular method of doing a particular type of exercise, he is *less* likely to solve problems similar in form to this exercise type but requiring a different solution.

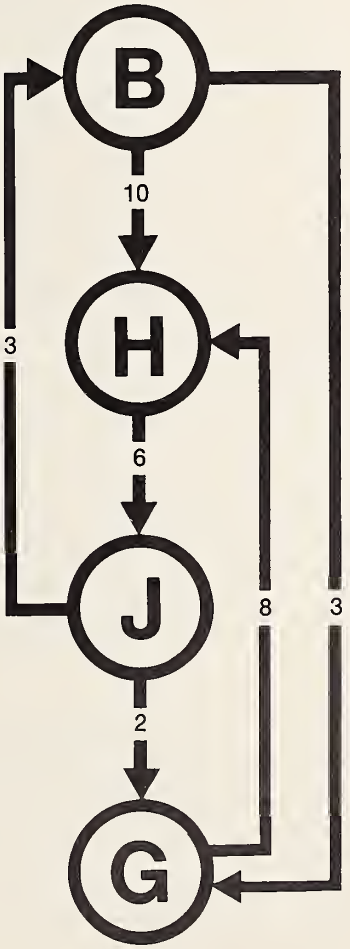
So far, I have described factors that may inhibit problem-solving. Of course there are also problem-solving behaviors that emphasize the *positive* aspects of problem-solving – actively searching for rules as yet untried, trying to represent the problem in new and more fruitful ways, trying to utilize the information in the problem more efficiently, or to locate and decrease gaps in knowledge, recalling and utilizing tactics that were successful in solving similar problems, and so on. These aspects are of the greatest importance. However, in the remainder of this article, I will restrict the discussion to methods for overcoming the three inhibiting factors mentioned above – difficulties with representation, memory, and set.

The Use of Diagrams in Mathematics Problems

Diagrams are a familiar problem-solving aid, not just in mathematics but in practically any area capable of a schematic representation, from flow charts for procedures in organizations to time charts in history. Some kinds of diagrams are used so frequently that we almost think of them as standard types. Diagrams seem particularly well adapted to help in overcoming difficulties with representation and memory, and may assist with set as well. There are, of course, other ways of overcoming these difficulties, but we will concentrate on diagrams.

Diagrams, properly used, can improve one's representation of a problem. Consider this example:
'Four friends owe each other money. Bill owes Harry $10, Jack owes Bill $3, George owes Harry $8, Jack owes George $2, Harry owes Jack $6, and Bill owes George $3. If they all pay each other on the same afternoon, how much will each have gained or lost?'

One possible diagram is



What the diagram does here is to provide a 'reality' for the story that makes it much easier for the student to comprehend the relations involved. In addition, the diagram makes it easier for the student to see relationships that are only implicit in the verbal account. However, it does not substitute for thinking. It merely provides an external representation that may assist thinking. All of us have at times found support for our thoughts in the simplest kind of drawing.

Besides making some reality easier to comprehend or some verbal account more real, diagrams serve the purpose of saving short-term memory. If the information is continually present in the diagram, there is no need to remember it actively. Our own and a variety of other research suggests it is especially desirable for children to learn to reduce the short-term memory requirements of tasks as much as possible since children have relatively short-term memory spans. There is no evidence that the short-term memory span can itself be improved by practice, although one may discover strategies for using it more effectively.

Because it presents so many relationships implicit in the problem and relieves the student of the strain of remembering the complete problem, the diagram may either suggest responses he might otherwise not have thought of, or free him to consider other possibilities.

What is true for diagrams is, of course, also true for other forms of external representation such as imagery, although imagery is not as memory-saving as is a diagram. Acting out the story may also help the student to extract information from the written word.

Much efficient thinking can also go on at quite a formal level. Most people would have no trouble with the argument 'If all X's are Y's and all Y's are Q's, then all X's must be Q's.' However, if the difficulty is increased somewhat, it is usually not enough to think only 'in words.' Try yourself on this one:

'All X's are Y's and some Y's are Q's. Is it true, false, or not certain that some Q's are X's?'

Experimental Use of Diagramming Materials

During the past eighteen months I have been engaged in efforts to produce materials for problem-solving in mathematics suitable for the grade 6 to 8 level, although mainly grade 7 children have been involved so far. Dr. Floyd Robinson of the OISE field center at St. Catharines has been conducting a similar study.

Initially our efforts were mainly directed at developing new and positive problem-solving strategies with grade 7 students in Toronto. The results of this first attempt were not encouraging, although there were clear indications of where we were going wrong. It soon emerged that the major emphasis should be on representational skills and that some of our problems required the use of mathematical skills with which the students were not very familiar.

As a consequence, we shifted our efforts last year to developing diagramming skills in an attempt to improve understanding both of problems and of basic mathematics. Four grade 7 classes in each of three schools were involved. Over a period of three months, three classes in each school were given two specially prepared lessons per week. The control classes pursued their regular mathematics lessons. One experimental class (Group I) in each school concentrated on diagramming simple mathematical operations – for example, multiplication and combinations of operations-graphs, and class relationships (cross-classifications and hierarchical classifications).The emphasis was on improving understanding of the mathematical and logical principles in solving very simple problems. Another class (Group II) was in addition given a number of verbal problems to solve, without any special instruction. The third class (Group III) spent some extra time using diagrams of particular kinds as problem-solving aids. Each group, including the control class, was given a pretest and a posttest consisting of a variety of difficult problems. When the class means were corrected for initial performance, the results over all three schools were: Group I – 7.74, Group II – 6.47, Group III – 6.97, Control Group – 6.07.

Statistical tests showed that the control group mean was significantly lower than means for the other three groups. What is of interest is that the use of diagrams with these three groups paid off most when used more intensively in the simplest applications. However, with such small numbers, variations both in classes and in teaching styles are likely to influence the results considerably, and more research is clearly needed before much confidence can be placed in the results. Robinson's experimental groups, for example, which were more like Group III, made very considerable gains over his control group.

Rationale for the Present Materials

On the basis of our findings and the marked improvements found by Robinson, we have assembled a set of experimental materials from both studies for use with grade 7 students either as part of the regular mathematics classes or as supplementary materials. Titled 'Problem Solving in Mathematics: Understanding Problems,' the materials (based on both Robinson's and my own ideas) emphasize the use of diagrams; they also include work on a minimum number of important mathematical ideas.

As far as using diagrams is concerned, three kinds of experience seem to be needed. First, children need to discover that a large variety of situations *can* be represented using a diagram. It is fairly easy for the student to represent simple spatial objects and relationships – for example, plans and scale drawings, or linkages in simple machines such as pulleys – in diagram form. His use of diagrams can then progress until he can represent quite abstract and *non*-spatial situations in diagram form; for example, the student should ultimately be able to use various diagrams to show class relationships, vectors to show profit and loss, and simple flow charts to show the main points in a 'story' problem.

Second, children need to learn the use of number lines, vectors, Venn diagrams, contingency tables, graphs, and other well-known standard diagrams. In view of the findings on negative transfer, however, it would seem important not to let the students think of these as the only possible diagrams or models. The rule still applies that in learning to solve problems it is better to use several approaches rather than one on a given problem, and it is desirable to try out the same approach on many different types of problems.

Third, children need to learn to develop their own diagrams in solving problems. It is probably expecting too much that their diagrams will be novel, but they could well devise new combinations of diagram types. Incidentally, the most useful diagrams seem to be the simplest. Boxes, rectangles, straight lines, and arrows can be used to represent a variety of situations.

Of course, the idea of using diagrams in this way is not a methodological invention. Many teachers already encourage diagram drawing. However, observation of children in grades 5 to 9 provides fairly convincing proof that children do not as a rule make efficient use of diagrams. We hope our materials will help.

While diagrams are not the final word, the most profound difficulty with problem-solving is that of adequate representation, and diagrams do help.

If the child already possesses adequate representation and language skills, it is still an open question whether problem-solving can be further improved by teaching special strategies. The most profitable direction of research at the moment appears to be in terms of teaching students in grade 8 and beyond how to reduce short-term memory load, and how to increase systematically the number of alternatives they can generate for themselves in problem-solving.

Note: For further information about the materials described above, write to Glen Evans, Department of Applied Psychology, OISE, 252 Bloor Street West, Toronto.

The second article on the role of the teacher in promoting educational change.

PROGRAM DEVELOPMENT AT THE LOCAL LEVEL

K. F. Prueter,
Office of Field Development,
OISE

On a recent visit to Sudbury, I attended an evening meeting of the Sudbury District Program Coordinating Committee, which advises and assists OISE's Midnorthern Field Centre. On the committee were representatives of the regional office of the Department of Education, Sudbury Teachers' College, the Cambrian College of Applied Arts and Technology, Laurentian University, OISE, the Sudbury District Separate School Board, the Sudbury District Board of Education, and a number of others concerned with educational development in the Sudbury region. Also attending the meeting, as observers, were senior education officials, the regional director of the Ontario Department of Education, trustees, parents, and representatives of the local television and radio stations. It was truly a meeting of that amorphous group – 'all those interested in education.'

The committee exists to identify major educational needs of the region and, by making use of all available community resources, to plan activities to meet those needs. Three presentations were made at the meeting.

Isabel Patchett, a kindergarten teacher with the Sudbury District Board, explained how the subcommittee of which she was chairman had made a careful study of OISE's Conceptual Skills Program (see *Orbit 4),* with assistance from OISE staff members responsible for the program. She now recommended that the program be tried out in Sudbury District schools, and here she asked Dr. John Nicholas, Head of the Midnorthern Centre, to assist teachers in evaluating the results.

Bob Remnant, Master Teacher of History with the Sudbury District Board, expressed the interest of his subcommittee in improving the teaching of social studies through a Canadian issues inquiry program. Such a program had already been implemented at the secondary school level by the Borough of York, in cooperation with OISE, and he proposed trying out the materials in Sudbury schools. Of interest was his suggestion that the materials should be modified to include issues of local concern.

In the final presentation of the evening, Peter Evans, Master Teacher of English for the Sudbury Board, proposed setting up a project for upgrading the reading and writing skills of students whose first language was French, and developing tests to measure achievement.

Each of the presentations generated a considerable amount of discussion, with the raising of such issues as how, if the results were encouraging, the programs could best be extended throughout the region and how, at a more basic level, research can influence practice.

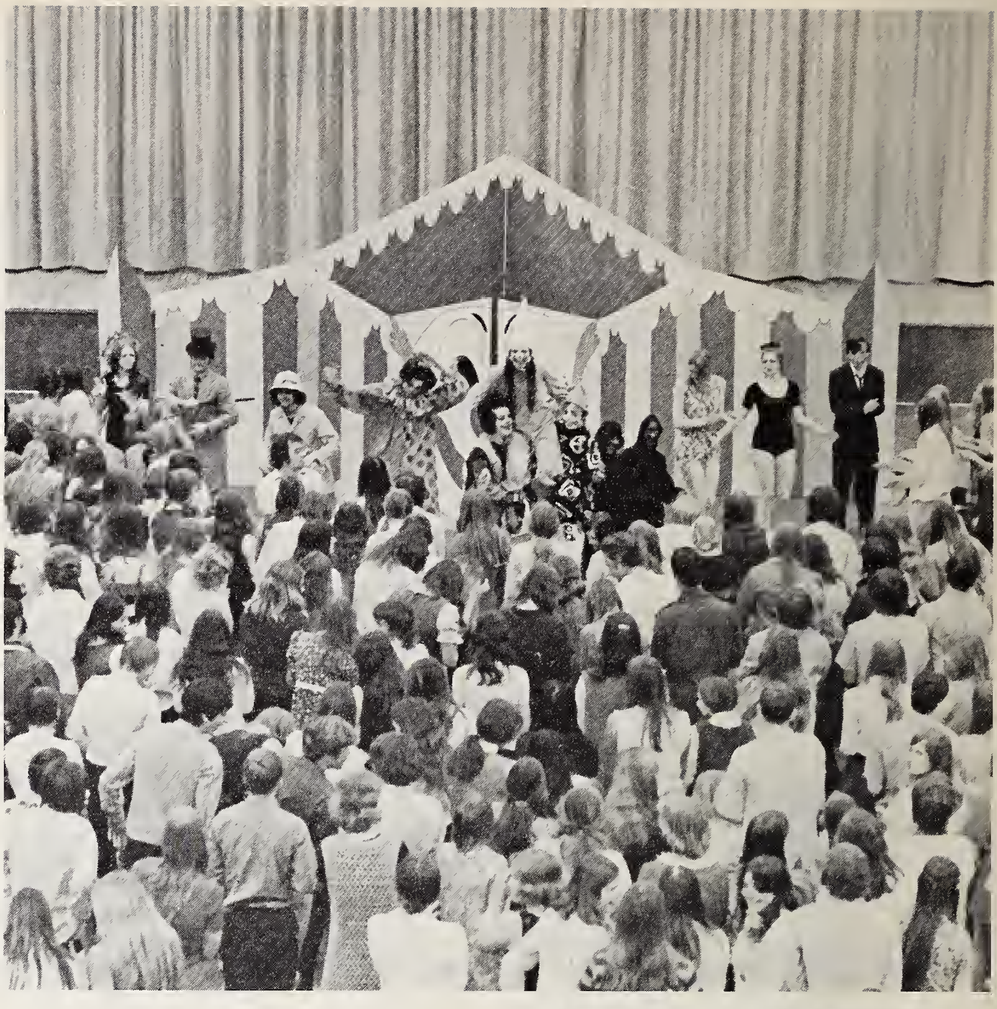
In my view, such meetings offer a number of object lessons:
– In curriculum development, most topics have already been considered by others, and before embarking on a project it is wise to study all available material written on the topic.
– The initiative for identifying topics and setting up programs dealing with them should be undertaken by local teachers.
– Perhaps the most effective strategy for curriculum development is to work through study teams in the region. The members can draw on the talents of local resource people and (where relevant) make use of local materials.

The Midnorthern Centre in the Community
Consultation, with both individuals and groups, represents a large part of the Centre's work. This is the pattern for all OISE's field centres, which endeavor to serve the individual needs of different communities through joining with them in studying, planning for, and implementing improvements in schools, teaching methods, and the curriculum.

Over a four-month period in the 1970/71 school year, Midnorthern Centre responded to the requests of teachers and principals in the region for advice on many aspects of education. Among them –
Teacher expectations of paraprofessionals (OTF Survey)
Open plan elementary and secondary schools
A middle school arithmetic study
Leadership in a school of socioeconomically disadvantaged students
Objectives of a school in a socioeconomically disadvantaged area
Development of a reading readiness test for northern Ontario
What does a teacher do with classroom objectives?

In the same period, the Centre cooperated with the Department of Education in Region 2 in studying whether the role of psychologists and social workers vis-à-vis remediation in schools should be clinical or preventive and the whole question of nongrading and discovery learning in open plan schools.

Members of the Centre's staff also took part in almost sixty meetings involving individuals and groups from Laurentian University, Sudbury Teachers' College, Cambrian College, the Ontario Department of Education (Region 2), the Indian Affairs Branch, and a number of school boards.



Grade 12 plays circus

Robert Kerr,
Ontario County Board of Education

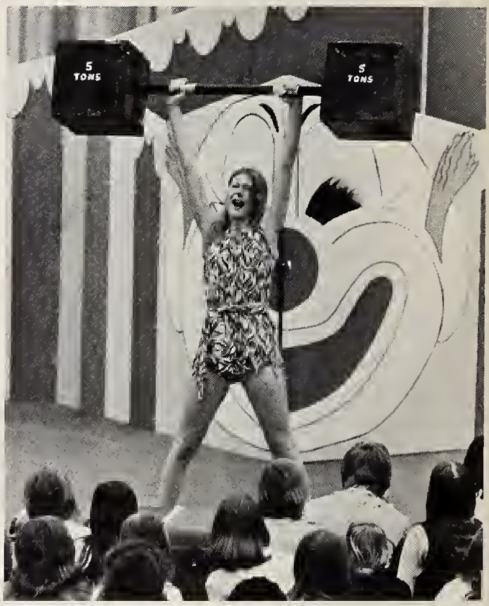
'Hello – we're a circus
We're here to bring you some fun
So come and join us every one.'

(The opening chorus of *The Littlest Clown,* a play written and produced by the theater arts class of O'Neill Collegiate and Vocational Institute in Oshawa, in cooperation with the International Reading Association. Tune – an air from *Hair.*)

Theater arts programs are becoming increasingly imaginative, but Oshawa's O'Neill Collegiate and Vocational Institute established a new high with its presentation of *The Littlest Clown.* Written and produced by the grade 12 theater arts class, with the help of teacher-director-technical-adviser Nat James, the play was their first venture into the field of children's theater. More than 2,700 eminently qualified critics from the primary grades of Oshawa's public schools enthusiastically endorsed the undertaking.

A musical play featuring acrobats, clowns, trained seals, and lions is always tantalizing fare for a young audience, but the O'Neill presentation was irresistible. The special ingredients were a wicked stepfather and his terrified run-away stepdaughter. Children were needed to frighten the stepfather, to eat the candy floss – even if it was 'just pretend,' to catch the escaping fleas – even though they were 'only imaginary,' and to sing with the trained seals when they led 'Row, Row, Row Your Boat.' All in all, a real circus might have found it difficult to offer more attractions.

The stage setting was simple. A colorful backdrop, a huge clown's head flanked by red and yellow stripes, set the mood. The acting area was the floor space immediately in front of it. There were no artificial barriers – the audience, seated in a semicircle on the floor within easy reach of the players, was completely caught up in the performance. Music was provided by a group seated at the side of the stage playing an electric guitar, electric organ, and drums.



Because *The Littlest Clown* was designed as a touring production, props, costumes, and scenery were kept to a minimum. The props and costumes fitted neatly into trunks, and the backdrop – thanks to its ingenious design – folded flat for travel. During a two-week tour, the students presented their play fourteen times in eight different schools. With such a crowded schedule, time was a vital factor and careful planning was needed to ensure that none was wasted.

All aspects of the production were handled by the students themselves. They were responsible for writing the play and its songs, for direction and acting, stage sets and management, designing and making the costumes, makeup, and the tour schedule. The pressures of a real schedule with its related crises made the project a theatrical experience rather than a classroom exercise. While the students may not have found show business as glamorous as they expected, the honest enthusiasm of their audiences was a source of delight.

The Littlest Clown took theater arts beyond the walls of a secondary school and into the world of children. As children's theater, it drew the ideal audience – rooms full of youngsters fully and joyously seizing the opportunities it offered for audience participation. As an introduction to theater for primary school pupils, it was the best possible vehicle – a participatory play written for them and performed in their own school, with the actors close enough to touch and no big crowds around.

The experiment was a success from every standpoint. Significantly, too, it represented K-13 integration in actual operation – elementary and secondary schools working together to their mutual advantage.

Open Education:

Some research answers to basic questions

How do programs offered in open plan, or open concept, schools differ from those in other schools? Are pupils in these schools doing as well in basic skills – reading and mathematics, for example – as pupils in traditional schools? Has 'open education' changed pupils' or teachers' expectations of what is to be learned and of how learning is to be achieved? If open plan programs produce outcomes not sought by other schools, what is traded off for such results?

If York County's experience is any guide, these are the sort of basic questions frequently asked by trustees, administrators, teachers, and parents of children attending open plan schools. Such schools commonly feature large, open instructional spaces and significant program modifications. In the last couple of years, the York County Board has investigated some of these questions in its search for clues to the answers.

Brian Burnham,
Research Officer,
York County Board of Education

The First Investigations

By 1969, York County, just north of Metropolitan Toronto, had one secondary and four elementary open plan schools. (Actually, they had been under the jurisdiction of five different boards prior to their amalgamation under a county board that year.) At first, no one could say whether open planning involved much more than architectural innovation. Only for the high school – Thornlea Secondary School – was a formal program of self-examination and external assessment in progress.

The investigation the new county board initially launched sought to clarify the meaning of 'openness' and so to determine to what extent 'open' teaching *strategies* prevailed in open plan and more traditionally designed schools in the county. It was also hoped to identify the behavioral outcomes of open education programs and design further studies to determine to what extent open and traditional schools produced these outcomes.

Since schools involved in the investigation might not give the same priority to accomplishments in basic skills, a continuing study of reading and mathematics achievement between grade 1 and grade 3 was also begun in 1970. There was a general concern with whether these basic skills were developed at the same rate under an open plan regime or whether there was some trade-off here for other accomplishments.

Behavioral Differences
From a search of the literature back to the 1930s and 1940s, themes related to 'openness' were drawn together into 'Anatomy of Open Education,' a bare-bones summary of open education's assumptions and an overview of its accomplishments and problems. (A revised edition of this brief paper was published in mimeograph form by the York County Board in September 1970.)

The first paragraph of 'Anatomy of Open Education' states:
'Open education has become widely synonymous with the notion of modern education. As such, the term has much of the vagueness which accompanies such catch-all notions. While and where open education refers merely to school architecture which reduces the number of school walls and halls, there is little confusion in distinguishing open from structured or traditional schools. But this narrow definition of openness exists only where the school buildings dictate the educational programs within. In modern schools, hopefully, "the educational containers . . . mold themselves to the fluid activities within, instead of the other way around." This urges attention to a school's internal activities, rather than to its construction, in order to understand how open education differs from other concepts.'

What generally best distinguish openness in elementary education today, this summary suggests, are the assumptions its proponents make about certain closely related aspects of human nature and the school setting: namely, about motivation in young children and their teachers, optimum (physical) learning conditions, social learning among youngsters and interpersonal relations between pupils and teachers, the nature of children's intellectual development and 'knowledge,' and the data sources for evaluating pupil progress.

The assumptions explored in 'Anatomy of Open Education' helped a committee of York County elementary school principals to identify several critical teaching strategies and outcomes that would have to be observed in a learning setting before open education could be said to be practiced. These strategies and outcomes, which are listed in the column headed

'Criterion Outcome' in table 1, provided the basis for the design of a direct study of the learning setting. Throughout early 1970, a team of sixteen (mainly principals of county elementary schools) embarked on such a study in the county's four open plan elementary schools and in three 'traditional' schools that had been selected as controls.

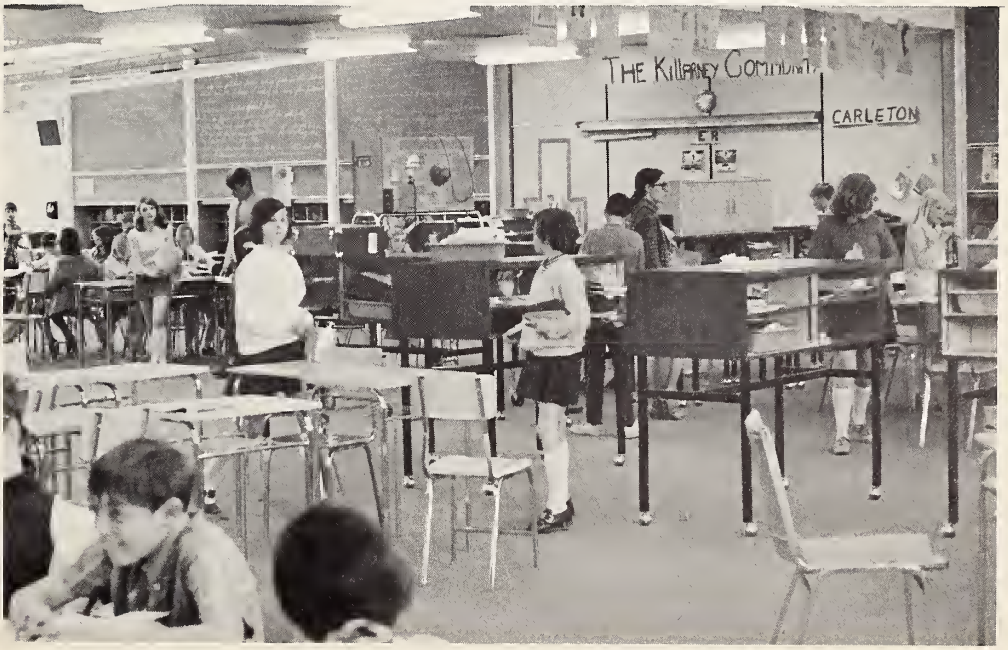
Seven of the team members collected data that might help to account for differences in programs or their outcomes. They found that the three control schools professed aims for their pupils essentially identifiable with those of open education. They also found that the open plan schools were newer (but, on balance, did not possess better physical resources), and had larger enrollments, slightly more experienced staffs, and a higher proportion of male to female teachers. The other differences observed were negligible.

Meanwhile, the other nine members of the team were trained in classroom observation techniques. They then visited the schools, each working in at least one open plan and one control school. There they conducted 'shadow studies,' day-long observations of eighteen pupils, twelve of whom were selected at random from open plan schools and six from the control schools. As table 1 shows, of the nine outcomes (items 1–6) looked for, six were found in the majority of open plan schools against only two in the controls. However, caution must be exercised in interpreting the findings, not only because the number of cases was small but also because they were weighted by a preponderance in the grade 5 to 8 level (a reflection of the fact that two of York's first open plan units were senior public schools). Furthermore, evidence for shared decision-making may not be readily observable in a one-day visit.

Several of the findings were compatible with those of earlier studies of other open

TABLE 1: Summary of Behavioral Differences

	Found in the majority of . . .		
Criterion Outcome	open plan cases	control cases	Trend of Difference
1. a) Pupil has the opportunity to share in decisions that touch him closely	no	no	no significant difference
b) Pupil uses the opportunity	no	no	no significant difference
2. Pupil successfully initiates activity which reflects his personal interests	yes	no	favors open plan schools
3. a) Pupil has opportunity to display personal responsibility	yes	yes	no significant difference
b) Pupil uses opportunity well	yes	no	favors open plan schools
4. Teachers plan cooperatively	yes	no	favors open plan schools
5. a) Pupil raises pertinent questions	yes	no	favors open plan schools
b) Pupil shows pertinent skills to discover own answers	no	no	no significant difference
6. Pupil displays regard toward others in responding	yes	yes	no significant difference
7. a) Observer judges environment 'comfortable' for learning	yes (100%)	yes (50%)	favors open plan schools
b) Observer would like to be a pupil in this setting	yes	no	favors open plan schools



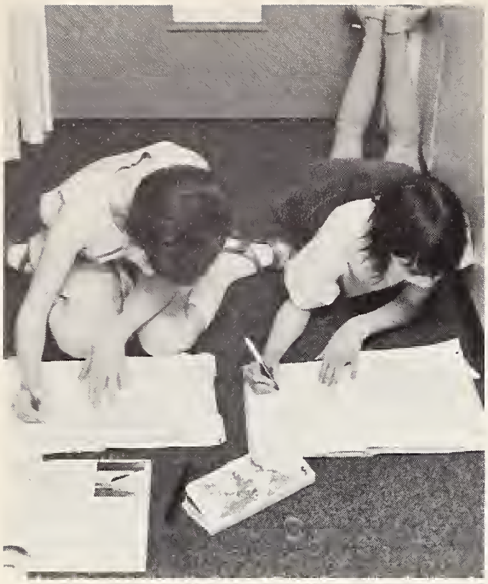


TABLE 2: Summary of IQ and Achievement Differences

	Number Tested	Mean IQ	Mean Grade Equivalent	
			Reading	Mathematics
Open plan 'A'	69	106	1.8	1.6
'A's' controls	210	105	1.7	1.7
A-1	*98*	*101*	*1.5*	*1.5*
A-2	*34*	*110*	*2.2*	*2.0*
A-3	*27*	*110*	*1.7*	*1.5*
A-4	*51*	*107*	*1.9*	*1.8*
Open plan 'B'	20	108	1.9	2.0
'B's' controls	215	105	1.7	1.7
B-1	*32*	*97*	*1.3*	*1.4*
B-2	*45*	*99*	*1.5*	*1.7*
B-3	*48*	*108*	*2.1*	*1.9*
B-4	*50*	*108*	*1.7*	*1.6*
B-5	*40*	*108*	*1.8*	*1.8*
Test norms		100	1.8	1.8
County means*		109	1.8	1.8

*Derived from administrations of tests to grade 1 pupils in 47 classes (22 schools, including 3 separate schools), May 1971.

plan schools, especially with regard to the pupils' roles in initiating personally meaningful activities and making good use of opportunities to display responsibility toward themselves as learners. The general hypothesis that the open setting increases cooperative planning and teaching was also supported. The widespread demonstration of mutual regard among pupils and teachers is a compliment to all the schools in this study. However, indications that many pupils were not displaying (or being allowed to display) skills in discovering answers for themselves suggested that a key aspect of openness was missing.

Several of the individual case studies made it clear that the criterion outcomes of themselves did not necessarily determine the educational worth of the day's activities; the correlation between 'good' learning and the criterion outcomes indicating open education seemed low for some pupils. For some youngsters, and on some occasions, a structured program geared to external standards or limited mobility within an enclosed area may be desirable. An alert, flexible teacher in an educational container that molds its space to differing learning needs is likely preferable to a doctrinaire champion of any single environmental shell. Bearing this in mind, the York County Board has allocated about 40 percent of the instructional space in schools now being opened to traditional, more or less permanently 'closed' classroom areas.

IQ and Achievement Differences

The first phase of the investigation into pupil achievement in reading and mathematics was completed in the spring of 1971. A standardized test of accomplishment in these subjects was administered to grade 1 pupils in two open plan and nine control schools selected on the basis of similarities in their school enrollments and socioeconomic levels, and the proximity of the different schools. The first open plan school was matched against four control schools, the second against five control schools.

Two tests – both group 'paper-and-pencil' tests – were selected for this project: the Canadian Cognitive Abilities Test, Primary 1, Form 1, 1970 (CCAT), and the Metropolitan Achievement Test, Primary 1, Form G, 1970 ed. (MAT).

Because both tests were new, they were carefully checked out before use. The achievement test was screened twice for suitability, first by test experts from the Ontario Institute for Studies in Education and the board staff, and second by committees of grade 1 teachers and board resource people. Because there were no Canadian norms available for the new achievement test, it was decided to establish a York County mean for it and also for the CCAT. This was done by administering the tests to 583 pupils in eleven county schools not in the sample, as well as to the 514 pupils in the eleven open plan and control schools.

The tests were administered last May. Through Dr. Ross Traub, Director of the Evaluation Centre at OISE, assistance was provided in the electronic collation and tabulation of scores. A summary of the results is shown in table 2.

The IQ results on the CCAT were not significantly different, all falling within one four-point score band (104-108) when the controls' scores were averaged. Scores were in line with the tentative county mean (109) as well as with each other, and compared favorably with the Canadian norm (100).

The expected grade equivalent for the achievement test batteries was 1.8. The actual mean scores across the county were reading – 1.81, mathematics – 1.79. Both open plan schools met or surpassed this standard in reading, while both control groups, when averaged, fell about 0.1 (i.e., one month) below that mark. The average mathematics achievement for all eleven schools in the study fell just below 1.8, with open plan school 'B' and three control schools exceeding the norm. All in all, this was a very normal distribution.

When the analysis of variance was performed on the scores, no significant differences (.05 level) were found, although the marginal differences tended to favor open plan schools. Thus there is no evidence to support the fear that open education trades off basic skills at the grade 1 level. Follow-up testing of these pupils through grades 2 and 3 will be conducted later.

Other Investigations

Other investigations relating to open education were also launched by the York County Board in 1970-71, but results are not yet available.

Dr. Hy Day of York University is studying creativity, curiosity, and intelligence in grade 5 pupils, and is hoping to develop suitable tests and methods to assess differences that might be apparent by the time pupils have spent five or six years in open or other schools. To a similar end, Dr. Clive Beck of OISE is working with grade 5 and 6 classes in the area of human values and moral judgment. Dr. Jeremy Finn of the State University of New York has completed data collection for a project in which he is investigating relationships among expectations and achievement in grades 4, 5, and 6 in open plan and other schools in the county.

The conviction remains that there are many other dimensions that need to be examined before the information we are uncovering can be fully useful. Meanwhile, the answers we are beginning to find may be helpful wherever open education is being questioned.

The Coordinator – Whence and Whither?

Jack McCabe,
Coordinator of Guidance Services,
Metropolitan Separate School Board

The coordinator is a recent and significant addition to the Ontario educational scene. Who he is or what he does is not readily stated in general terms, for his role varies from board to board. Nor does it represent a single function within a given board, for he serves in broad and diverse areas. Matters relating directly to instruction tend to be made the responsibility of one coordinator, and those having to do with ancillary services the responsibility of another.

The position came into being in Ontario in the early 1960s and gained popularity as the proliferation of county boards placed an increasingly heavy burden on existing administrative and consultative personnel. The sudden and widespread acceptance of the coordinator's role in North America is underlined by the fact that no reference to it has been found in works on education written prior to 1955. The question then is, 'Why did the role emerge at this particular time?'

The rapid growth of affluence in the past decade figures strongly in the situation. The 1960s were years of economic well-being in Ontario. Salaries were increasing, unemployment was low, and government spending had reached a record level. Under these conditions, it is not surprising that the conservatism that had characterized Ontario education for decades gave way to a new liberalism, and widespread innovation began. In this area, perhaps the most significant moves were the setting up of the Provincial Committee on Aims and Objectives in Education in the Schools of Ontario and the inception of the Ontario Institute for Studies in Education. Education was changing, and the combination of big budgets, a liberalized philosophy of education, and growing innovation produced a climate conducive to development of the coordinator's role.

But more than a conducive climate is needed to nurture the development of a new educational role, and the pressures of the 'knowledge explosion' and growing specialization produced the stimulus. Although comment on it is something of a cliché, the 1960s faced the challenge of a world in which, in the previous quarter of a century, man's knowledge had increased by an amount roughly equal to the total store of knowledge amassed before that time. Small wonder that a growing army of specialists had to be recruited to apply and expand this knowledge – a situation that inevitably affected the school system. As one of the major socializing agencies of the community, the school has traditionally been associated with intellectual leadership. In the past, children went to school to learn skills and form thought patterns they could not acquire elsewhere and the school held a monopoly as the disseminator of the secrets of man's development in all the major intellectual fields. But revolutionary methods of communication suddenly penetrated the very sanctity of the family living room, and the Johnny-come-latelys of the mass media began to educate more quickly and in a more entertaining fashion. For the first time in its history, the school had to compete for its position as curator of institutionalized knowledge.

These developments placed extraordinary demands on the classroom teacher, whose training was in general procedures and whose mastery of content tended to be predicated upon high school graduation or, at best, a general university degree. Now he was being forced to specialize in a particular area of content and to develop competence in a variety of pedagogical approaches. By the same token, school boards were finding it necessary to employ teachers in terms of their specialization.

Supervision of the specialist teacher in relation to the rapidly expanding body of knowledge and the development of curricula in the subject specialty now presented a major problem for the superintendent, whose role as school administrator had become almost exclusively management oriented. To relieve him of this burden, the 'specialist's specialist,' or program consultant, was introduced at the departmental level. And later, when responsibility for program development was passed to school boards, the position of coordinator came into being. The role of the curriculum coordinator at the local level really parallels that of the program consultant at the provincial level.

In addition to those problems arising from the burgeoning of knowledge, school systems throughout North America faced the pressures of increased enrollments created by the high post-war birth rate. Staff requirements increased sharply and the scramble to provide a sufficient number of competent teachers led to the institution of accelerated and summer training programs, the granting of letters of permission to cover the employment of semi-qualified persons, and the recruitment of teachers in Britain. As a result, the schools had to cope with an abnormally large number of teachers who were either inexperienced or unfamiliar with education in Ontario and for whom on-the-job or inservice training had to be provided. Since the inspector or assistant superintendent was already fully occupied with the normal duties of supervision and administration, school boards had to find others to look after a rapidly expanding inservice training program. One solution lay in the appointment of subject and service area specialists (coordinators), charged with interpreting their disciplines to neophyte and partially trained teachers.

The growing sophistication of school administration produced yet another result. Administrators began to realize that scientific management – rule by memorandum and prescription – was not only failing to produce efficiency but was destroying the organization's most valuable resource, the creativity of its personnel. Teachers were teaching to cover courses, to prepare students for external examinations, and to present a smooth and polished performance when the inspector invaded their domain. It was upon such criteria that the quality of teaching was being judged, but few thought to examine the quality of learning that took place.

Influenced by vastly increased budgets and pressured by mushrooming knowledge and soaring enrollments, school administrators began to see things in a new light. Professional excellence was still the goal – but not to the exclusion of all else. The frame of reference needed to be broadened to allow for individual needs. This concern with human values also brought a new approach to supervision. Evaluation as a means of professional assassination was rejected, and supervision became increasingly a consultative function to which attached neither threat nor punishment.

Again the question of responsibility arose. Since the superintendent as final evaluator must adjudicate all cases of gross inefficiency, responsibility for this new role was seen as incompatible with his function. Obviously, it must fall to the lot of another staff member, and the coordinator's developing role was a logical repository.

The foregoing serves as an informal review of the development of the coordinator's role in Ontario. But let us go further and look at who the coordinator is and what limitations circumscribe his role. There is no ready analysis, for the position is so new that parameters have yet to be established. Interpretation varies from school board to school board, and even within a given board coordinators interpret their roles within broadly varying limits. Inevitably, however, certain general areas of responsibility and subgroupings of the role tend to be constant.

As was suggested earlier, school systems, especially the larger ones, tend to differentiate between curriculum and service coordinators. The curriculum coordinator deals with content and pedagogy; the service coordinator looks after supportive and ancillary services – among them, psychological services, student services, research, special education, library, audiovisual resources, and guidance.

The curriculum coordinator has two basic and interrelated functions – curriculum development and inservice training. Curriculum development takes in both the creation of new programs and the adaptation of existing ones. In either case, these programs generally establish desirable objectives, and are broad in scope and nonprescriptive. Teachers are encouraged to adapt the coordinator's guidelines to local conditions. The second function – inservice training – grows naturally out of the first. Through special after-hours courses, school visits, and professional development sessions, the coordinator assists teachers in implementing new or adapted programs. An essential third function of the curriculum coordinator is the constant evaluation and revision of the programs he has introduced.

The service coordinator's responsibilities are more diffuse. He must first of all interpret the principles governing his area of responsibility in the light of the local situation. Having done this, he must see that the teaching staff fully understands the services provided by his department and has ready access to them. Basic to all his other duties, however, is the responsibility he bears for ensuring that personnel, facilities, finances, and time are available for his program.

The position of coordinator demands a highly qualified incumbent – an observation that raises the question of what training might be regarded as appropriate. Departmental regulations require that the subject coordinator hold both a teaching certificate and a supervisor's or specialist's certificate in his subject area. In addition, most school boards expect him to hold at least a bachelor's degree, and many stipulate graduate degrees. The service coordinator is not required to hold a teaching certificate, and for this reason certification is seldom a condition of employment. He usually holds a first graduate degree in his discipline, however, and he may have a doctorate, frequently obtained through leave of absence from his position.

In part, at least, we have now established who the coordinator is. But the factors that circumscribe his role have yet to be considered. Since organizational staff and line conflicts account for many of the coordinator's problems, it should perhaps be pointed out that 'staff functions' refer to situations in which the incumbent bears an advisory relationship to other members of an organization in their pursuit of objectives, while 'line functions' refer to those in which the incumbent bears a supervisory relationship to others in the organization.

The staff specialist is part of a horizontal relationship, while the line officer is part of a vertical relationship. Although the two interact on an equal footing, their impact on the system may be very different. The staff specialist bases his authority on expertise; the line officer bases his on power. The former advises; the latter implements. The staff specialist must possess expertise that is beyond question and be clear and certain in his field. The line officer must be a 'sifter' who can absorb the various points of view presented by staff specialists, weigh them, and choose the most appropriate course of action.

Although few positions entail exclusively line or staff functions, it is not difficult to separate occupations into the two categories in terms of their major orientation. In education, it is clear that the line begins with the teacher. At the secondary level, it moves to assistant head or assistant chairman, and then to the head or chairman. At both elementary and secondary levels, it proceeds to vice-principal, principal, area or assistant superintendent, superintendent, deputy director of education or deputy superintendent of separate schools, and finally director of education or superintendent of separate schools. In school board administration, the staff department includes the curriculum and service coordinators, the assistant superintendent to whom they report, and the superintendent, who is responsible for the entire staff operation. On the business side of the board's operation, a parallel structure exists for handling all financial matters.

Within this framework, the coordinator is subject to the conflicts and restrictions that face all staff in the exercise of their duties. But the classic struggle between line and staff functions is accentuated when staff positions are bastardized by requiring the incumbent to exercise line responsibilities in some areas and staff responsibilities in others.

In his 1964 Quance Lectures, Dr. George Flower (presently Coordinator of Graduate Studies, OISE) specified some guidelines for internal organization under decentralization. Within these guidelines, he established that there must be a 'clear distinction between line and staff officers' and pointed out that it is effectively delineated by placing staff personnel directly in schools or regional offices and personnel with line responsibility in the central office.

Role implementation for the coordinator, then, is dependent upon organizational acceptance of his staff function. De jure, this acceptance has been given; de facto, it is neither acknowledged nor understood – a situation that produces a conflict of roles. Coordinators, administrators, and teachers all reject this staff orientation under certain circumstances. The coordinator rejects it when his advice is ignored and he uses personal associations with line officials to influence decision-making. It is then only a small step to giving him responsibility for line decisions involving his specialty – a change in role that can occur almost without his being aware of it. Administrators ignore the coordinator's staff orientation when they refuse to accept responsibility for the decisions they base on his advice. This is not to say that the coordinator should not be held responsible for the advice he gives, but that the administrator must accept responsibility for his own decisions. The teacher fails to recognize the coordinator's staff function when he sees him as a person who can intercede on his behalf rather than as a specialist who can assist him in program implementation.

The coordinator's task is sometimes further complicated by conflicts with school-located specialists who feel perfectly competent to 'run their own show' and resent the intrusion of an outsider. However, as the specialist begins to perceive the coordinator less as a supervisor and more as an adviser, this situation eases. Defensive reaction on the part of principals may also be a problem since the coordinator's advice is, now and then, mistakenly interpreted as interference in the school program. In this area, preliminary meetings between coordinators, principals, and teachers are usually effective in establishing rapport and frequently lead to invitations to the coordinator to visit schools and assist in program implementation. Under these circumstances, highly successful work may be done; but when a coordinator is *sent* to a school, the reaction is often so defensive that nothing of value can be accomplished.

This brief examination suggests that the successful exercise of the coordinator's role is heavily dependent upon cooperation at all levels. Here, as in other areas of human endeavor, cooperation grows with understanding. The coordinator has much to contribute to the school system, but he will be hamstrung in his efforts if his role is not clearly understood by the people with whom he works. He is an adviser – perhaps more precisely, a facilitator – whose function is to bring together a variety of activities in a proper and meaningful relationship. If he is given an opportunity to do this, his role will be stimulating and significant both for him and for his colleagues in administrative office and school alike.

Teaching Aids from the Community

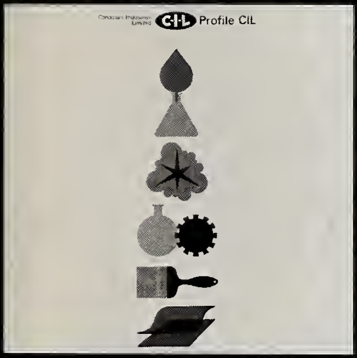
Canadian Industries Limited

The materials listed are available free of charge. Requests should be sent to the address appearing below. Classroom quantities can be supplied only where indicated.

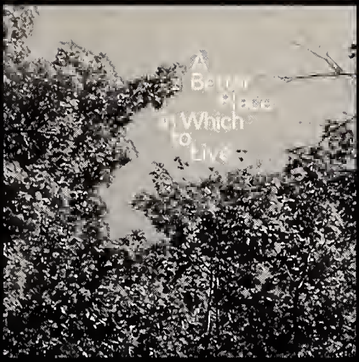
Education Services,
Advertising and Public Relations,
Canadian Industries Limited,
P.O. Box 10,
Montréal 101, Québec

PUBLICATIONS

Profile CIL
An illustrated 20-page booklet, produced annually, briefly outlining the scope of CIL — its history, locations, products, and the industries it serves. Available to teachers and students.



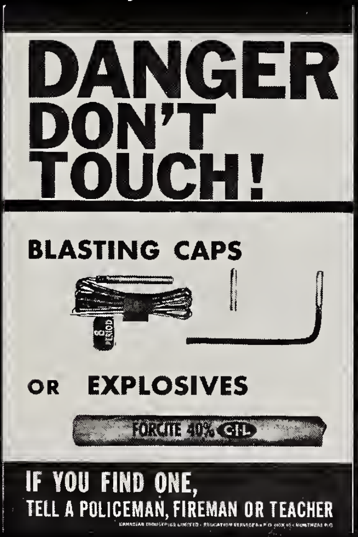
Essays on Environmental Health
A series of eight essays discussing environmental problems that bring about air, water, soil, and noise pollution, their possible solutions, and the need for concern and immediate action. Of interest to students in grade 11 and up, including university level. Available to teachers and students.



A Better Place in Which to Live
An illustrated 20-page booklet dealing with environmental pollution, CIL's concern about it, and how this company is coping with the problem at each of its locations. Available to teachers and students.

SPECIAL AIDS

Danger! Don't Touch!
An 11½" x 17½" safety poster showing three types of blasting caps and a stick of dynamite. Caption reads 'DANGER DON'T TOUCH, if you find one, tell a policeman, fireman or teacher.' For use in elementary and secondary schools. Available to teachers only.



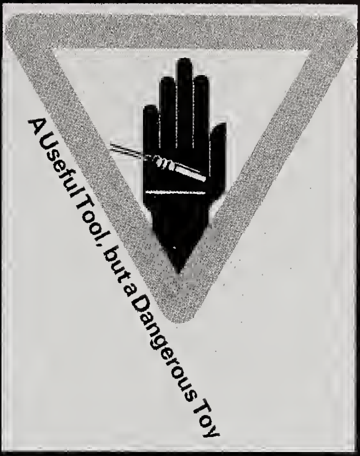
DANGER DON'T TOUCH!

BLASTING CAPS

OR EXPLOSIVES

FORCITE 40% C-I-L

IF YOU FIND ONE,
TELL A POLICEMAN, FIREMAN OR TEACHER



A Useful Tool, but a Dangerous Toy
An illustrated single-page safety leaflet describing the various kinds of blasting caps. 'A Useful Tool, but a Dangerous Toy' explains the danger involved in handling them. For use in elementary and secondary schools. Available in classroom quantities.

Monographs/Flow Sheets
Folders containing monographs and flow sheets on the production and use of chlorine and sodium hydroxide, ammonia, nitric acid, and sulphuric acid. Monographs available to teachers only; flow sheets, to students in classroom quantities.

Lab Safety Posters
A collection of twelve colored posters (11½" x 17½") outlining the basic rules for safety in the lab. For use in junior and senior levels of secondary school. Available to teachers only.

FILMS

Films in the CIL Film Library are all 16 mm sound and are available on a free loan basis. The borrower pays only the return postage. The films are suitable for use with students at all levels of secondary school. Many subjects are dealt with, including wildlife, agriculture, art, sports, safety, blasting operations, ammunition, and plastics. Special educational films on the following topics are also available: the balance, laboratory chemical preparations, catalysis, chemical careers, chemical families, chemistry of water, chlorine, chromatography, combustion, color, crystallization, distillation, equilibrium, filtration, discovery of oxygen, molecular motions, nitric acid, oxygen reduction, paint, radioactivity, refrigeration, silicones, and sodium hydroxide. Titles and particulars are listed in CIL's 27-page film catalogue. The catalogue is available to teachers only and should be obtained before the selection of films is undertaken.

A number of titles are also available in French. A catalogue of these may be obtained by writing to:
La Cinémathèque CIL,
Boîte Postale 10,
Montréal 101, Québec.

Profile of a School 12 London South Secondary School

Originally called South Collegiate Institute, London South Secondary School was founded in 1925 and quickly earned a reputation for high standards of scholarship. Over the years, this reputation has been maintained.

South was among the first to recognize the advantages of curricular and organizational innovations in serving the needs of its students. Individual timetables were set up for its senior students as far back as the early '50s — before computers were available for this purpose. As a result, little fundamental change was needed when the credit system was introduced in the fall of 1970.

The school is widely known for its pioneering of film production arts as a credit course in the senior levels of the curriculum. This course is a highly professional one, involving the production of 16 mm sound films in both black-and-white and color. Each student produces at least one five-minute film, which brings him into contact with the techniques of script writing, photography, composing and shooting scenes, editing, and sound mixing. Emphasis is placed upon film as an art form. But through their experience with the technical means by which films are produced, the students also become proficient in handling film-making equipment.

The course has gained widespread acceptance in the community. During the pilot year (1969/70), the London Chamber of Commerce commissioned the students in the class to script and produce a thirty-minute documentary on shoplifting. They even wrote original music for the soundtrack of the film, which is titled 'The Castleless King.' The success of this venture led the City of London Planning Board last year to commission a thirty-minute color documentary on the 1970 Official Plan for the City of London. This highly praised film has now been printed for distribution.

South attempts not only to provide the best for its students but also to get the best from them. The school's ventures into student participation in evaluating both themselves and their instructional programs have sharpened the focus on individual student needs. Students may now contract for independent study, engage in individual study projects, and take some examinations at their own option. In the current school year, students will also participate in the formal evaluation of their teachers' competence.

In short, it is through exploring new educational methods that the school is attempting to build on its own tradition of coupling high academic standards with productive innovation.